What is claimed is:

1. An optical disc comprising a title area and a manager area, wherein

the title area stores a plurality of video titles, each of which is a video production and which each include route information and a plurality of pieces of video information retrieved according to the route information,

wherein there are three types of video titles which are a first type, a second type, and a third type, with video titles of the first type being retrieved according to only a piece of route information, video titles of the second type being retrieved according to a plurality of pieces of route information and branch information, and video titles of the third type being retrieved according to a plurality of pieces of route information without the branch information,

and wherein the manager area includes:

an address management information area for storing a plurality of pieces of address management information which each include an address of one of the plurality of video titles; and

a playback type information area for storing a plurality of pieces of playback type information, wherein the plurality of pieces of playback type information correspond to the plurality of pieces of address management information, each of the plurality of pieces of playback type information including a first flag and a second flag, of which the first flag indicates whether a corresponding video title is retrieved according to a

31 piece of route information or according to a plurality of

32 pieces of route information, and the second flag

33 indicates whether the route information of the

34 corresponding video title includes the branch

35 information.

1   2. The optical disc of Claim 1, wherein

2   each of the plurality of pieces of playback type

3   information indicates that a disc reproduction apparatus

4   can execute AV functioning for a corresponding video

5   title if the corresponding video title is at least in one

6   of a first case and a second case, wherein in the first

7   case, the first flag indicates that the corresponding

8   video title is retrieved according to only one piece of

9   route information, and in the second case, the second

10 flag indicates that the route information of the

11 corresponding video title does not include the branch

12 information, and

13   wherein the AV functioning at least includes a

14 search function for allowing the disc reproduction

15 apparatus to search and reproduce an arbitrary portion of

16 a video title and a feedback function for allowing the

17 disc reproduction apparatus to monitor and display a

18 reproduction elapsed time.

1   3. The optical disc of Claim 2, wherein

2   the playback type information includes a third

3   flag which indicates whether all pieces of route

4   information of a corresponding video title are of a

5   normal playback type, wherein the normal playback type is

6   a type in which the plurality of pieces of video

7   information specified by the route information are

8   sequentially reproduced in a predetermined order.

4. The optical disc of Claim 2, wherein the playback type information includes a fourth flag which indicates whether all pieces of route information of a corresponding video title are of a branch-in-title type, wherein the branch-in-title type is a type in which a current video title does not branch to another video title.

5. The optical disc of Claim 2, wherein the playback type information includes a fifth flag which indicates whether all pieces of route information of a corresponding video title are of a branch destination auto selection type, wherein the branch destination auto selection type is a type in which a default branch destination is specified for a case when no branch destination has been selected by an operator.

6. The optical disc of Claim 2,

wherein each of the plurality of pieces of video information includes a plurality of video blocks, wherein each of the plurality of video blocks includes video data and unit time management information, wherein the video data is compressed data of a certain unit time and the unit time management information controls a reproduction during the certain unit time, and

wherein the title area includes a plurality of index number tables each including a plurality of index numbers and search destination information that indicates addresses of video blocks respectively corresponding to the plurality of index numbers, wherein the plurality of index number tables correspond to a plurality of pieces of route information of the first type and the second type.

1   7.   The optical disc of Claim 6,

2   wherein the plurality of video blocks are

3   arranged in an order of reproduction in a direction of

4   rotation of the optical disc, and

5   wherein the title area further includes a

6   plurality of time map tables including information

7   indicating a relation between the plurality of video

8   blocks and a plurality of time codes, wherein a time code

9   is displayed by the disc reproduction apparatus when a

10 corresponding video block is reproduced, wherein the

11 plurality of time map tables correspond to a plurality of

12 pieces of route information of the first type and the

13 second type.

1   8.   The optical disc of Claim 2, wherein the manager area

2   and the title area are formed on a surface of an

3   information layer, wherein the information layer is

4   formed between a first transparent substrate and a second

5   transparent substrate, each of the first transparent

6   substrate and the second transparent substrate having a

7   thickness range of 0.5mm to 0.7mm.

1   9.   A disc reproduction apparatus for reproducing an

2   optical disc, the optical disc comprising a title area

3   and a manager area, wherein the title area stores a

4   plurality of video titles, each of which is a video

5   production and which each include route information and a

6   plurality of pieces of video information retrieved

7   according to the route information, wherein the manager

8   area includes: an address management information area for

9   storing a plurality of pieces of address management

10 information each of which includes an address of one of

11 the plurality of video titles; and a playback type

12 information area for storing a plurality of pieces of

13 playback type information, wherein the plurality of

14 pieces of playback type information correspond to the

15 plurality of pieces of address management information,

16 wherein each of the plurality of pieces of playback type

17 information includes a first flag and a second flag, the

18 first flag indicating whether a corresponding video title

19 is retrieved according to only one piece of route

20 information or according to a plurality of pieces of

21 route information, and the second flag indicating whether

22 the route information of the corresponding video title

23 includes the branch information, wherein each of the

24 plurality of pieces of playback type information

25 indicates that the disc reproduction apparatus can

26 execute AV functioning in a corresponding video title if

27 the corresponding video title is at least in one of a

28 first case and a second case, wherein in the first case,

29 the first flag indicates that the corresponding video

30 title is retrieved according to one piece of route

31 information, wherein in the second case, the second flag

32 indicates that the route information of the corresponding

33 video title does not include any branch information,

34 wherein the AV functioning at least includes a search

35 function for allowing the disc reproduction apparatus to

36 search and reproduce an arbitrary portion of the video

37 title and a feedback function for allowing the disc

38 reproduction apparatus to monitor and display a

39 reproduction elapsed time,

40   the disc reproduction apparatus comprising:

41   an optical pickup for optically reading data from

42 the optical disc;

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43   a drive mechanism for driving the optical pickup;

44   first controlling means for controlling the drive

45 mechanism to have the optical position read data from the

46 manager area;

47   a manager buffer for storing the data read by the

48 first controlling means;

49   receiving means for receiving a video title

50 selected by an operator to be reproduced;

51   calculating means for calculating an address of

52 the video title selected by the operator by referring to

53 the manager buffer;

54   second controlling means for controlling the

55 drive mechanism to move the optical pickup and to have

56 the video title read from a position specified by the

57 address calculated by the calculating means;

58   judging means for judging whether the AV

59 functioning can be executed in the video title read by

60 the second controlling means by referring to the first

61 flag and the second flag corresponding to the video

62 title; and

63   AV functioning executing means for executing the

64 AV functioning only when the judging means judges that

65 the AV functioning can be used in the video title.

1   10. The disc reproduction apparatus of Claim 9, wherein

2 the judging means includes:

3   a search condition table storing unit for storing

4 a search condition table which includes a combination of

5 flag values, the combination of flag values being a

6 condition under which the search function is executed;

7   a playback type information fetching unit for

8 fetching a piece of playback type information from the

9   manager buffer corresponding to the video title selected

10   by the operator; and

11   a condition comparing unit for comparing a

12   combination of flag values in the piece of playback type

13   information fetched by the playback type information

14   fetching unit with the combination of flag values in the

15   search condition table,

16   wherein the AV functioning executing means

17   includes:

18   a search destination receiving unit for

19   generating, on receiving an instruction to execute the

20   search function from the operator, an interrupt request

21   specifying a search destination; and

22   a search function executing unit for instructing

23   the second controlling means to change a position of the

24   optical pickup to the search destination only when the

25   combination of flag values in the fetched playback type

26   information matches the combination of flag values in the

27   search condition table.

1   11.   The disc reproduction apparatus of Claim 10, wherein

2   the combination of flag values in the search condition

3   table is one of a first case and a second case, wherein

4   in the first case, the first flag indicates that the

5   corresponding video title is retrieved according to only

6   one piece of route information, wherein in the second

7   case, the second flag indicates that the route

8   information of the corresponding video title does not

9   include any branch information.

1   12.   The disc reproduction apparatus of Claim 11,

2   wherein the playback type information includes a

3   third flag which indicates whether all pieces of route

4 information of a corresponding video title are of a

5 normal playback type,

6   wherein the normal playback type is a type in

7 which the plurality of pieces of video information

8 specified by the route information are sequentially

9 reproduced in a predetermined order,

10   wherein the combination of flag values in the

11 search condition table is one of a third case and a

12 fourth case, wherein in the third case, the third flag

13 indicates that all pieces of route information of the

14 corresponding video title are of the normal playback type

15 and the first flag indicates that the corresponding video

16 title is retrieved according to only one piece of route

17 information, wherein in the fourth case, the third flag

18 indicates that all pieces of route information of the

19 corresponding video title are of a normal playback type

20 and the second flag indicates that the route information

21 of the corresponding video title does not include any

22 branch information, wherein

23   the condition comparing unit compares the

24 combination of flag values in the piece of playback type

25 information fetched by the playback type information

26 fetching unit with the combination of flag values in the

27 search condition table.

1 13.   The disc reproduction apparatus of Claim 11, wherein

2 the playback type information includes a fourth flag

3 which indicates whether all pieces of route information

4 of a corresponding video title are of a branch

5 destination auto

6 selection type,

7   wherein the branch destination auto selection

8 type is a type in which a default branch destination is

9 specified when no branch destination has been selected by

10 an operator,

11   wherein the combination of flag values in the

12 search condition table is one of the first case, the

13 second case, and a fifth case, wherein in the fifth case,

14 the fourth flag indicates that all pieces of route

15 information of the corresponding video title are of the

16 branch destination auto selection type,

17   wherein the condition comparing unit compares the

18 combination of flag values in the piece of playback type

19 information fetched by the playback type information

20 fetching unit with the combination of flag values in the

21 search condition table.

1 14. The disc reproduction apparatus of Claim 10, wherein

2   each of the plurality of pieces of video information

3 includes a plurality of video blocks, wherein each of the

4 plurality of video blocks includes video data and unit

5 time management information, wherein the video data is

6 compressed data of a certain unit time and the unit time

7 management information controls a reproduction during the

8 certain unit time,

9   wherein the title area includes an index number

10 table including a plurality of index numbers and search

11 destination information which indicates addresses of

12 video blocks respectively corresponding to the plurality

13 of index numbers, an index number table corresponds to a

14 piece of route information,

15   wherein the search destination receiving unit, on

16 receiving a numeral input by the operator as an index

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17 number, refers to the index number table and determining

18 an address of a video block corresponding to the input

19 index number as the search destination,

20   wherein the search function executing unit

21 instructs the second controlling means to change a

22 position of the optical pickup to the search destination

23 only when the combination of flag values in the fetched

24 playback type information matches the combination of flag

25 values in the search condition table.

1   15. The disc reproduction apparatus of Claim 14 further

2   comprising:

3   program start instruction receiving means for

4   receiving from the operator a notification of inputting a

5   plurality of index numbers for a programmed reproduction;

6   holding means for holding a set of index numbers

7   if the search destination receiving unit receives a

8   plurality of numerals from the operator as the set of

9   index numbers after the program start instruction

10 receiving means has received the notification of

11 inputting a plurality of index numbers; and

12   programmed reproduction executing means for

13 activating the search function executing unit as many

14 times as the number of index numbers in the set of index

15 numbers so that the search function executing unit

16 instructs the second controlling means to sequentially

17 change the position of the optical pickup to the search

18 destinations corresponding to the index numbers in the

19 set of index numbers.

1   16. The disc reproduction apparatus of Claim 10, wherein

2   each of the plurality of pieces of video

3   information includes a plurality of video blocks which

4   are arranged in time series in an order of reproduction,

5   wherein each of the plurality of video blocks includes

6   video data and unit time management information, wherein

7   the video data is compressed data of a certain unit time

8   and the unit time management information controls a

9   reproduction during the certain unit time,

10   wherein the title area includes a plurality of

11   time map tables including information indicating a

12   relation between the plurality of video blocks and a

13   plurality of time codes,

14   wherein a time code is displayed by the disc

15   reproduction apparatus when a corresponding video block

16   is reproduced,

17   wherein the plurality of time map tables

18   correspond to a plurality of pieces of route information

19   of the first type and the second type,

20   wherein the search destination receiving unit

21   for, on receiving a numeral input by the operator as a

22   time code, referring to the time map table and

23   determining an address of a video block corresponding to

24   the input time code as the search destination,

25   wherein the search function executing unit

26   instructs the second controlling means to change a

27   position of the optical pickup to the search destination

28   only when the combination of flag values in the fetched

29   playback type information matches the combination of flag

30   values in the search condition table.

1   17.   The disc reproduction apparatus of Claim 9, wherein

2   the judging means includes:

3   a feedback condition table storing unit for storing

4   a feedback condition table which includes a combination

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5   of flag values, the combination of flag values being a

6   condition under which the search function is executed;

7   a playback type information fetching unit for

8   fetching a piece of playback type information from the

9   manager buffer corresponding to the video title selected

10   by the operator; and

11   a condition comparing unit for comparing a

12   combination of flag values in the piece of playback type

13   information fetched by the playback type information

14   fetching unit with the combination of flag values in the

15   feedback condition table,

16   wherein the AV functioning executing means

17   includes:

18   a monitoring unit for monitoring an amount of

19   progress of the optical pickup which progresses under

20   control of the second controlling unit;

21   a feedback function executing unit for generating

22   display feedback information based on the amount of

23   progress of the optical pickup monitored by the

24   monitoring unit only when the combination of flag values

25   in the fetched playback type information matches the

26   combination of flag values in the feedback condition

27   table; and

28   a displaying unit for displaying the display

29   feedback information generated by the feedback function

30   executing unit.

1   18. The disc reproduction apparatus of Claim 17, wherein

2   the combination of flag values in the feedback

3   condition table is one of a first case and a second case,

4   wherein in the first case, the first flag indicates that

5   the corresponding video title is retrieved according to a

6   piece of route information, wherein in the second case,

7   the second flag indicates that the route information of

8   the corresponding video title does not include the branch

9   information.

1   19.   The disc reproduction apparatus of Claim 18,

2   wherein the playback type information includes a

3   third flag which indicates whether all pieces of route

4   information of a corresponding video title are of a

5   normal playback type,

6   wherein the normal playback type is a type in

7   which the plurality of pieces of video information

8   specified by the route information are sequentially

9   reproduced in a predetermined order,

10   wherein the combination of flag values in the

11   feedback condition table is one of a third case and a

12   fourth case, wherein in the third case, the third flag

13   indicates that all pieces of route information of the

14   corresponding video title are of the normal playback type

15   and the first flag indicates that the corresponding video

16   title is retrieved according to a piece of route

17   information, wherein in the second case, the third flag

18   indicates that all pieces of route information of the

19   corresponding video title are of a normal playback type

20   and the second flag indicates that the route information

21   of the corresponding video title does not include the

22   branch information,

23   wherein the condition comparing unit compares the

24   combination of flag values in the piece of playback type

25   information fetched by the playback type information

26   fetching unit with the combination of flag values in the

27   feedback condition table.

1 20. The disc reproduction apparatus of Claim 18,

2 wherein the playback type information includes a

3 fourth flag which indicates whether all pieces of route

4 information of a corresponding video title are of a

5 branch destination auto selection type,

6 wherein the branch destination auto selection

7 type is a type in which a default branch destination is

8 specified when no branch destination has been selected by

9 an operator,

10 wherein the combination of flag values in the

11 feedback condition table is one of the first case, the

12 second case, and a fifth case,

13 wherein in the fifth case, the fourth flag

14 indicates that all pieces of route information of the

15 corresponding video title are of the branch destination

16 auto selection type,

17 wherein the condition comparing unit compares the

18 combination of flag values in the piece of playback type

19 information fetched by the playback type information

20 fetching unit with the combination of flag values in the

21 feedback condition table.

1 21. The disc reproduction apparatus of Claim 17,

2 wherein each of the plurality of pieces of video

3 information includes a plurality of video blocks, wherein

4 each of the plurality of video blocks includes video data

5 and unit time management information, wherein the video

6 data is compressed data of a certain unit time and the

7 unit time management information controls a reproduction

8 during the certain unit time,

9 wherein the title area includes an index number

10 table including a plurality of index numbers and search

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11 destination information which indicates addresses of

12 video blocks respectively corresponding to the plurality

13 of index numbers, wherein the index number table

14 corresponds to a piece of route information,

15   wherein the monitoring unit monitors an address

16 of a video block read by the optical pickup and refers to

17 the index number table to determine an index number which

18 corresponds to the monitored address,

19 wherein the feedback function executing unit generates

20 the display feedback information based on the index

21 number determined by the monitoring unit only when the

22 combination of flag values in the fetched playback type

23 information matches the combination of flag values in the

24 feedback condition table,

25   wherein the displaying unit displays the display

26 feedback information generated by the feedback function

27 executing unit.

1   22.   The disc reproduction apparatus of Claim 21,

2 wherein each of the plurality of video titles in the

3 optical disc has an identification number,

4   wherein the monitoring unit further monitors the

5 identification number of a video title read by the

6 optical pickup,

7   wherein the feedback function executing unit

8 generates the display feedback information based on the

9 identification number of the video title monitored by the

10 monitoring unit and the index number determined by the

11 monitoring unit when the combination of flag values in

12 the fetched playback type information matches the

13 combination of flag values in the feedback condition

14 table, wherein the feedback function executing unit

15 generates the display feedback information based on only

16 the identification number of the video title monitored by

17 the monitoring unit when the combination of flag values

18 in the fetched playback type information does not match

19 the combination of flag values in the feedback condition

20 table,

21   wherein the displaying unit displays the display

22 feedback information generated by the feedback function

23 executing unit.

1   23. The disc reproduction apparatus of Claim 17,

2   wherein each of the plurality of pieces of video

3   information includes a plurality of video blocks which

4   are arranged in time series in an order of reproduction,

5   wherein each of the plurality of video blocks

6   includes video data and unit time management information,

7   wherein the video data is compressed data of a certain

8   unit time and the unit time management information

9   controls a reproduction during the certain unit time,

10   wherein the optical disc includes a time map

11 table including information indicating a relation between

12 the plurality of video blocks and a plurality of time

13 codes,

14   wherein a time code is displayed by the disc

15 reproduction apparatus when a corresponding video block

16 is reproduced,

17   wherein the feedback function executing unit

18 includes:

19   an initial time code displaying unit for

20 displaying an initial time code with a certain format

21 when the second controlling means starts reading the

22 video title;

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23   a progress monitoring unit for monitoring a video

24 block read by the optical pickup; and

25   a time code updating unit for displaying a time

26 code corresponding to the video block monitored by the

27 progress monitoring unit by referring to the time map

28 table, wherein the time code updating unit updates the

29 initial time code first and continues to update as

30 reading of data by the optical pickup progresses.

1 24. The disc reproduction apparatus of Claim 23,

2 wherein each of the plurality of video titles in the

3 optical disc has an identification number,

4   wherein the monitoring unit further monitors the

5 identification number of a video title read by the

6 optical pickup,

7   wherein the feedback function executing unit

8 generates the display feedback information based on the

9 identification number of the video title monitored by the

10 monitoring unit and one of the initial time code and the

11 time code displayed by the time code updating unit when

12 the combination of flag values in the fetched playback

13 type information matches the combination of flag values

14 in the feedback condition table,

15   wherein the feedback function executing unit

16 generates the display feedback information based on only

17 the identification number of the video title monitored by

18 the monitoring unit when the combination of flag values

19 in the fetched playback type information does not match

20 the combination of flag values in the feedback condition

21 table,

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22   wherein the displaying unit displays the display

23   feedback information generated by the feedback function

24   executing unit.

1   25.   The disc reproduction apparatus of Claim 9, wherein

2   the playback type information includes a fourth

3   flag which indicates whether all pieces of route

4   information of a corresponding video title are of a

5   branch-in-title type,

6   wherein the branch-in-title type is a type in

7   which a current video title does not branch to another

8   video title,

9   wherein the disc reproduction apparatus further

10   comprises:

11   program start instruction receiving means for

12   receiving from the operator a notification of inputting a

13   plurality of index numbers for a programmed reproduction;

14   title number receiving means for receiving a

15   numeral input by the operator as a title number;

16   branch judging means for, every time the title

17   number receiving means receives a title number, judging

18   whether a video title corresponding to the title number

19   received by the title number receiving means branches to

20   another video title by referring to flags in the playback

21   type information of the video title;

22   holding means for holding a set of video title

23   numbers corresponding to video titles judged by the

24   branch judging means as not branching to another video

25   title; and

26   programmed reproduction executing means for

27   activating the calculating means and the second

28   controlling means as many times as the number of the

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29 video title numbers in the set of video title numbers so

30 that the video titles corresponding to the video title

31 numbers in the set of video title numbers are read in

32 sequence.

1 26. A method, applied to a disc reproduction apparatus

2 including a buffer, of reproducing an optical disc, the

3 optical disc comprising a plurality of video titles, a

4 plurality of pieces of management information, and a

5 plurality of pieces of playback type information, wherein

6 each of the plurality of video titles includes route

7 information and a plurality of pieces of video

8 information retrieved according to the route information,

9 wherein each of the plurality of pieces of management

10 information manages an address of a corresponding video

11 title, wherein each of the plurality of video titles is a

12 video production, wherein each of the plurality of pieces

13 of playback type information includes a first flag and a

14 second flag, wherein the first flag indicates whether a

15 corresponding video title is retrieved according to a

16 piece of route information or according to a plurality of

17 pieces of route information, and the second flag

18 indicates whether the route information of the

19 corresponding video title includes the branch

20 information, the method comprising:

21 a first writing step of writing a piece of

22 management information into the buffer;

23 a first receiving step of receiving a video title

24 selected by an operator to be reproduced;

25 a calculating step of calculating an address of

26 the video title selected by the operator by referring to

27 the buffer;

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28   a second controlling step of reading the video

29 title from a position specified by the address calculated

30 by the calculating step;

31   a judging step of judging whether AV functioning

32 can be executed in the video title read in the second

33 controlling step by referring to the first flag and the

34 second flag corresponding to the video title, wherein the

35 AV functioning at least includes a search function for

36 allowing the disc reproduction apparatus to search and

37 reproduce an arbitrary portion of the video title and a

38 feedback function for allowing the disc reproduction

39 apparatus to monitor and display a reproduction elapsed

40 time; and

41   an AV functioning executing step of executing the

42 AV functioning only when the judging step judges that the

43 AV functioning can be used in the video title.